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Retirement age and type as predictors of frailty: a retrospective cohort study of older businessmen

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ABSTRACT

Objectives To study the association between retirement characteristics and frailty in a homogenous population of former business executives.

Design Cross-sectional cohort study using data from the Helsinki Businessmen Study.

Setting Helsinki, Finland.

Participants 1324 Caucasian men, born in 1919 1934, who had worked as business executives and managers and of whom 95.9% had retired by the year 2000. Questions on age at and type of retirement, lifestyle and chronic conditions were embedded in questionnaires.

Primary and secondary outcome measures Frailty assessed according to a modi ed phenotype de nition at mean age 73.3 years.

Results Mean age at retirement was 61.3 years (SD 4.3) and 37.1% had retired due to old age. The prevalence of frailty was lowest among men retiring at ages 66 67 years but increased among those who worked up to age 70 years or older. Compared with men who retired before age 55 years, those retiring at ages 58 69 years were at decreased risk of frailty in old age relative to non-frailty (adjusted ORs 0.07 0.29, p<0.05). Compared with men who transitioned into old age retirement, those who retired due to disability were at increased risk of prefrailty (adjusted OR 1.53, 95% CI 1.01 to 2.32) and frailty (adjusted OR 3.52, 95% CI 1.97 to 6.29), relative to non-frailty.

Conclusion Exiting working life early and continuing to be occupationally active until age 70 years and older were both associated with increased risk of frailty among the men. Promotion of longer work careers could, however, promote healthier ageing, as the lowest prevalence of frailty was observed in former business executives who retired at ages 66 67 years.

Strengths and limitations of this study

- 3 This study is among the rst to report associations between the age at retirement, type of pension and frailty in old age among a homogenous population characterised with high socioeconomic position.
- 3 Generalisation of the results to other socioeconomic or occupational groups should be made with caution. The study included 1324 men who had worked as business executives and managers during their work careers.
- 3 Frailty was de ned according to a modi ed phenotype de nition, assessed using questionnaire data, and information on retirement characteristics was self-reported in this cross-sectional study.

INTRODUCTION

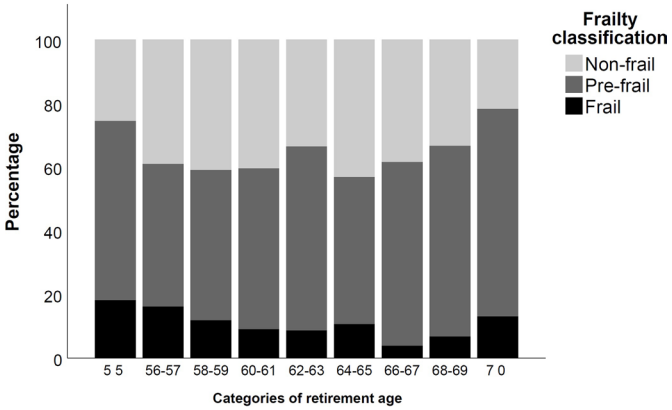

Figure 1 Distribution of frailty classi cation assessed at an average age of 73.3 years according to categories of age at retirement.

METHODS

Study population

Age at and type of retirement

Frailty

shrinking

weakness

exhaustion

low physical activity

Patient and public involvement

Covariates

RESULTS

Statistical methods

Age at and type of retirement

Table 1 Characteristics of the men according to retirement type (proportion and per cent unless stated otherwise)

	All	Old age retirement	Early old age retirement	Pension bene t package	Unemployment retirement	Disability retirement	P value*
n (%)	1324	507 (37.1)	288 (21.1)	251 (18.4)	103 (7.5)	175 (12.8)	
Old age characteristics assessed in the year 2000 (n=1324)							
Age in years, mean (SD)	73.3 (4.1)	74.6 (4.0)	72.9 (4.0)	72.5 (3.9)	71.4 (3.1)	72.6 (4.1)	<0.001
Cardiovascular disease, n (%)	812 (59.4)	307 (60.6)	159 (55.2)	155 (61.8)	47 (45.6)	124 (70.9)	<0.001
Diabetes, n (%)	113 (8.6)	35 (6.9)	22 (7.6)	26 (10.4)	7 (6.8)	23 (13.1)	0.018
Smoking status, n (%) (n=1322)							0.371
Current smoker	106 (8.0)	35 (6.9)	19 (6.6)	27 (10.8)	10 (9.7)	15 (8.6)	
Quit smoking	719 (54.8)	269 (53.3)	160 (55.6)	129 (51.4)	59 (57.3)	102 (58.3)	
Never smoked	497 (37.2)	201 (39.8)	109 (37.8)	95 (37.8)	34 (33.0)	58 (33.1)	
Alcohol consumption, n (%) (n=1040)							<0.001
None	153 (14.7)	68 (16.9)	30 (12.9)	23 (11.3)	11 (13.1)	21 (17.8)	
Light	448 (43.1)	176 (43.8)	114 (48.9)	79 (38.9)	36 (42.9)	43 (36.4)	
Moderate	234 (22.5)	103 (25.6)	39 (16.7)	47 (23.2)	18 (21.4)	27 (22.9)	
High	205 (19.7)	55 (13.7)	50 (21.5)	54 (26.6)	19 (22.6)	27 (22.9)	
Age at retirement (n=1284)							
In years, mean (SD)	61.3 (4.3)	63.5 (3.6)	61.0 (3.7)	60.6 (3.7)	59.1 (3.7)	57.7 (4.4)	<0.001
Categorised age at retirement, n (%) (n=1284)							<0.001
70 years	23 (1.8)	14 (2.9)	4 (1.4)	5 (2.0)	0	0	
68 69 years	15 (1.2)	11 (2.3)	1 (0.4)	2 (0.8)	0	1 (0.6)	
66 67 years	52 (4.1)	40 (8.2)	5 (1.8)	7 (2.9)	0	0	
64 65 years	273 (21.3)	204 (41.8)	35 (12.5)	21 (8.6)	6 (6.0)	7 (4.1)	
62 63 years	292 (22.8)	126 (25.8)	82 (29.2)	45 (18.4)	15 (15.0)	24 (14.0)	
60 61 years	321 (24.9)	69 (14.1)	85 (30.2)	90 (36.9)	38 (38.0)	39 (22.8)	
58 59 years	127 (9.9)	11 (2.3)	41 (14.6)	37 (15.2)	13 (13.0)	25 (14.6)	
56 57 years	87 (6.8)	3 (0.6)	17 (6.0)	20 (8.2)	17 (17.0)	30 (17.5)	
55 years	94 (7.3)	10 (2.0)	11 (3.9)	17 (7.0)	11 (11.0)	45 (26.3)	
Frailty assessed in the year 2000, n (%) (n=1324)							<0.001
Non-frail	496 (37.5)	177 (34.9)	108 (37.5)	123 (49.0)	44 (42.7)	44 (25.1)	
Prefrail	686 (51.8)	281 (55.4)	152 (52.8)	110 (43.8)	49 (47.6)	94 (53.7)	
Frail	142 (10.7)	49 (9.7)	28 (9.7)	18 (7.2)	10 (9.7)	37 (21.1)	
Stressfulness of work career, assessed in the year 2003 (n=972)							<0.001
0 (high stress) to 10 (no stress)	5.3 (2.8)	5.7 (2.9)	5.2 (2.8)	4.9 (2.7)	5.7 (3.0)	4.6 (2.7)	

*P for difference in means/distributions between groups.

Table 2 ORs and 95% CIs of prefrailty and frailty compared with non-frailty according to age at and type of retirement

	Prefrailty		Frailty	
	OR (95% CI)		OR (95% CI)	
	Model 1	Model 2	Model 1	Model 2
Categories of retirement age (years)				
70	0.78 (0.25 to 2.46)	0.83 (0.26 to 2.62)	0.28 (0.06 to 1.40)	0.38 (0.08 to 1.97)
68 69	0.51 (0.15 to 1.73)	0.55 (0.16 to 1.89)	0.11 (0.01 to 1.03)	0.10 (0.01 to 1.02)
66 67	0.49 (0.23 to 1.04)	0.52 (0.24 to 1.12)	0.07 (0.01 to 0.34)***	0.07 (0.01 to 0.37)**
64 65	0.37 (0.21 to 0.64)***	0.40 (0.22 to 0.70)***	0.19 (0.09 to 0.40)***	0.21 (0.10 to 0.46)***
62 63	0.61 (0.35 to 1.06)	0.67 (0.38 to 1.17)	0.20 (0.09 to 0.45)***	0.24 (0.11 to 0.54)***
60 61	0.49 (0.29 to 0.85)**	0.48 (0.28 to 0.83)**	0.22 (0.10 to 0.47)***	0.22 (0.10 to 0.47)***
58 59	0.45 (0.24 to 0.83)**	0.46 (0.25 to 0.87)*	0.28 (0.12 to 0.66)**	0.29 (0.12 to 0.70)**
56 57	0.50 (0.26 to 0.98)*	0.49 (0.25 to 0.98)*	0.51 (0.21 to 1.24)	0.45 (0.18 to 1.14)
55	(Ref)	(Ref)	(Ref)	(Ref)
Type of retirement				
Old age	(Ref)	(Ref)	(Ref)	(Ref)
Early old age	1.02 (0.74 to 1.40)	0.99 (0.72 to 1.37)	1.22 (0.71 to 2.09)	1.24 (0.72 to 2.16)
Pension bene t package	0.66 (0.47 to 0.91)*	0.61 (0.44 to 0.85)**	0.71 (0.39 to 1.30)	0.62 (0.33 to 1.15)
Unemployment	0.89 (0.56 to 1.41)	0.86 (0.54 to 1.37)	1.36 (0.62 to 2.98)	1.44 (0.64 to 3.21)
Disability	1.62 (1.07 to 2.45)*	1.46 (0.96 to 2.23)	4.34 (2.47 to 7.63)***	3.52 (1.97 to 6.29)***
Stressfulness of work career				
Per 1-unit increase	0.94 (0.89 to 0.99)*	0.94 (0.90 to 0.99)*	0.94 (0.86 to 1.03)	0.95 (0.87 to 1.04)

*P<0.001; **P<0.01; ***P<0.05.
Model 1 adjusted for age in the year 2000 (age at measuring frailty).
Model 2 adjusted additionally for smoking, alcohol consumption, cardiovascular disease and diabetes.

Age at retirement and frailty in old age

Type of retirement and frailty in old age

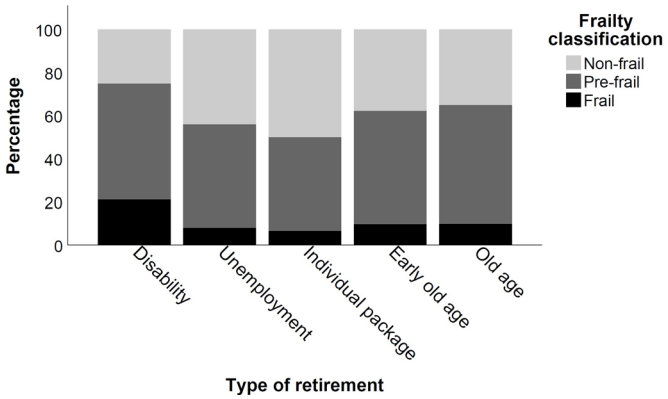

Figure 2 Distribution of frailty classi cation assessed at an average age of 73.3 years according to the type of retirement.

Stressfulness of work career

DISCUSSION

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Contributors MJH designed the present study, drafted the article, analysed the data and drafted the manuscript. MBvB designed the present study, interpreted the data and revised the article critically for important intellectual content. MEvB, NMP, TT and AYS interpreted the data and revised the article critically for important intellectual content. TES acquired funding for the cohort, data collection, interpreted the data and revised the article critically for important intellectual content.

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Competing interests None declared.

Patient consent for publication Not required.

Ethics approval The Ethics Committee of the Department of Medicine, University of Helsinki, has approved the research protocol of the follow-up study of HBS. All participants provided a written informed consent before participating in the study. The study adheres with the principles stated in the Declaration of Helsinki.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. Data may be obtained from a third party and are not publicly available. Inquiries regarding the data sets used and/or analysed during the current study can be directed to the principal investigator (TES) of the Helsinki Businessmen Study.

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